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**SECOND ORDER ANGLE OF INCIDENCE CORRECTIONS FOR GaAs/Ge SOLAR CELLS
WITH LOW ABSORPTANCE COVERGLASS**

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Objective: Determine any angle of incidence effects beyond the cosine and Fresnel reflection corrections.

Test Devices: Two samples each of a number of different GaAs/Ge cell assemblies were measured at incidence angles from 0° to 85°. Some test cells had blue-red reflection filters and some had infrared reflection filters. Some infrared reflection filters were modified to eliminate the loss from band-edge shifting and some infrared reflection filtered cells were irradiated before angle of incidence testing.

Conclusions: For cells with simple AR filter coverglasses, a combination of cosine and Fresnel reflection corrections gave very good correlation between predicted and measured values. Cells with blue-red or infrared reflection filters had measured values below predicted values in the middle range of incident angles probably due to band-edge shifting. There is a definite trend toward improved performance at high incidence angles probably due to edge and/or optical path length effects, however there was insufficient data to fully characterize the cause. The irradiation of cells does not grossly change angle of incidence response, however, there may be a slight improvement in the performance in the middle range of angles. The unexpected, non-linear Voc versus log of Isc results were not angle of incidence related.